BAGS

FALL 2010 SCIENTIFIC REPORT

The Fall 2010 *Bellingham Algebraic Geometry Seminar* took place on October 16, 2010 at the Western Washington University in Bellingham, WA, USA.

The meeting was attended by faculty members and graduate students from the University of British Columbia, the University of Colorado, and the University of Washington.

PARTICIPANTS

- UBC faculty members and postdoctoral fellows: Jim Carrell, Kalle Karu, Patrick Brosnan, Jonathan Wise, Mark Blunk.

- UBC graduate students: Zheng Hua, Robert Klinzmann, Ed Richmond

- UC faculty member: Sebastian Casalaina-Martin

- UW faculty members: Max Lieblich, Sándor Kovács

- UW graduate students: Alberto Chiecchio, Nathan Grigg, Zsolt Patakfalvi, Kiana Ross, Pál Zsámboki

SPEAKERS

Three invited speakers from UBC, UW, and the University of Colorado gave lectures:

- Patrick Brosnan (UBC)

  TITLE: Admissible normal functions and the locus of Hodge classes

  ABSTRACT: In the 90s, Cattani, Deligne and Kaplan answered a question of Weil by proving that the locus of Hodge classes is algebraic. In the end the theorem is a statement about variations of pure Hodge structure. I will explain a generalization of the theorem for admissibe variations of mixed Hodge structure due to G. Pearlstein, C. Schnell and myself.

- Zsolt Patakfalvi (UW)

  TITLE: Base change for the relative canonical sheaf in families of normal varieties

  ABSTRACT: In higher dimensional moduli theory, it is crucial to understand the base change behavior of the relative canonical sheaf, and of its reflexive powers. It determines what the right choice of moduli functor for higher dimensional stable schemes is. In this talk, I will discuss the base change behavior of the relative canonical sheaf itself. It has been known for a while that it is compatible with base change if the fibers are Cohen-Macaulay. Recently, compatibility has been proven if the fibers are log-canonical. I will present a statement that underscores the importance of these results by showing that this compatibility does not hold generally in families of normal varieties, not even over smooth bases.

- Sebastian Casalaina-Martin (Colorado)

    TITLE: Simultaneous stable reduction for curves with ADE singularities

    ABSTRACT: A basic question in moduli theory is to describe a stable reduction of a given family of curves. That is given a family of curves where the generic fiber is stable, one would like to "replace" the fibers that are not stable in such a was as to obtain a family of stable curves. Typically this will only be possible after a generically finite base change, and the question is to describe such a base change as well as the total space of the new family. The aim of this talk will be to present joint work with Radu Laza where we describe explicit stable reductions for families of curves with ADE singularities. ADE singularities, the most basic singularities beyond nodes, are also the first to be encountered in the Hassett-Keel program regarding the canonical model of the moduli space of stable curves. Connections with this program will also be discussed.